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faces. Hæmorrhages are especially to be noted in the lungs. The urine of animals poisoned by *Pseudechis* always contains albumen, sometimes hæmoglobin, and frequently blood.

An idea of the toxic value of the venom may be obtained by comparing it with other poisons, basing the comparison upon the number of grammes of an animal, viz., a rabbit, killed by one gramme of the venom injected subcutaneously.

Cobra	4,000,000.
Hoplocephalus curtus . .	4,000,000.
Pseudechis	2,000,000.
Diptheria toxine . . .	4,000,000 (about.)
Anthrax albuminoses . . .	80.
Toxo-peptone	3,000.

—F. C. KENYON.

PSYCHOLOGY.[1]

The Year 1896 in Scientific Psychology.—While the past year has shown no startling developments in psychology, it has been marked by steady progress and an unusual amount of activity. The experimental laboratories everywhere have been busy, and a large number of Laboratory Studies have been published.

In this country the activity has been especially marked; the *Psychological Review* and the *American Journal of Psychology* have devoted more than usual of their space to experimental work. The psychological department of Cornell University has moved into larger quarters in Morrill Hall, where it is reported to have nine rooms and 4,000 square feet of space. The laboratory at the University of Nebraska has moved into the new library building, and occupies a series of five rooms and 3,000 square feet of space. A laboratory of experimental psychology has been fitted up during the year at the University of Kansas, under the charge of Prof. Olin Templin. The University of Chicago and Columbia University are preparing to establish their laboratories in ampler quarters, when the new buildings are completed.

In Russia it is reported that the Universities of St. Petersburg, Moscow and Kieff have taken steps, in connection with the Minister of Education, looking to the establishment of psychological laboratories. The University of Kieff has petitioned for an appropriation of about

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[1] Edited by H. C. Warren, Princeton University, Princeton, N. J.

$3,000 to equip such a laboratory, and a yearly sum of $300 to maintain it. In addition to the older magazine, *Voprosi Philosophi i Psichologi*, which has always published a large number of psychological articles, a new Russian magazine has been started by Prof. A. A. Tokarsky, entitled *Zapiski Psichologetscheskoi Laboratori;* it is to be published quarterly as organ of the Psychiatrical Clinic at Moscow. Dr. W. von Bechterew has also established a new Review of Psychiatry, Nenrology and Experimental Psychology, to be published monthly at St. Petersburg.

In Germany a new psychological "Archiv" has been started by Prof. Götz Martius, under the title of *Beiträge zur Psychologie und Philosophie*, as organ of the laboratory at the University of Bonn. Like the *Psychologische Arbeiten*, established a year ago by Prof. Kraepelin at Heidelberg, it is to be devoted chiefly to laboratory studies, and will appear at irregular intervals. We note also the unusual activity of the *Zeitschrift für Psychologie*, which during the past year issued three complete volumes and over, without any apparent falling off in the standard of its contents.

In France, the *Année psychologique* has been very much enlarged, and includes a number of original articles—partly from the Paris Laboratory—as well as summaries of all important books and articles in all languages that appeared during the preceding year.

The increase of general interest in psychology has shown itself in the unusual number of articles on the subject that have appeared in the popular magazines and those devoted to various departments of science. The number of books, pamphlets and articles of more especial interest to the psychological "Fachmann" has also been remarkably large, as appears from the increased number of titles in the forth-coming *Psychological Index*. The bibliography of the *Anné psychologique* has joined forces with the latter annual, which is now issued in both English and French. The bibliography of the *Zeitschrift für Psychologie* covers the ground for German readers.

Among the books that have appeared during the year we may mention Wundt's "Grundriss der Psychologie," a compendium of his lectures on general psychology; this has already been translated into English by Dr. Judd of Wesleyan University. Prof. Jodl's "Lehrbuch der Psychologie," a book of some 760 pages, is the most notable German work on general psychology of the year. In England there have appeared a large two-volume work on "Analytic Psychology" by Mr. G. F. Stout, the Editor of *Mind*, and the "Elements of Psychology" by the late G. Croom Robertson, edited from his lecture notes by Mr. Rhys

Davids. In this country Prof. Titchener's "Outline of Psychology" is the leading contribution to empirical psychology. Among the more specialized works published during the year may be noted "Habit and Instinct" by Lloyd Morgan; "Studies of Childhood" by James Sully; and "La psychologie des sentiments" by Th. Ribot.

The important event of the year in psychological circles was the Third International Congress of Psychology, which met at Munich, August 4th to 7th, whose proceedings have already been reported in this journal. The meeting of the American Psychological Association in Boston, December 29th and 30th, has also been noticed here. In April, 1896, the New York Academy of Sciences formed a section devoted to psychology, anthropology and philology, whose meetings were to be held monthly. American psychologists have been invited to attend the meeting of the British Association at Toronto, next summer, in connection with the physiological section of that body. There is a movement on foot to secure a more adequate representation of psychology in the American Association for the Advancement of Science, under the section of anthropology. The International Bibliographical Conference, which met in London, voted to include psychology among the 15 leading sciences to be catalogued.

A prize of £50, to be called the Welby Prize, has been offered for the best treatise upon the following subject: *The causes of the present obscurity in psychological and philosophical terminology, and the directions in which we may hope for efficient practical remedy.* The committee in charge consists of Prof. James Sully, London; Mr. G. F. Stout, Aberdeen; Prof. E. B. Titchener, Cornell (Ithaca); Prof. Oswald Külpe, Würzburg; and Prof. Emile Boirac, Paris. The papers may be written in English, French or German, and are to be handed in before January 1, 1898.

The Macmillan Co. announce a "Dictionary of Philosophy and Psychology," which is now being prepared under the editorial supervision of Prof. Baldwin, of Princeton University. The topics in normal psychology are in charge of Prof. Cattell of Columbia University, G. F. Stout, W. E. Johnson of Cambridge University, Prof. Titchener of Cornell University, and the Editor; the department of mental pathology and anthropology is assumed by Prof. Jastrow of Wisconsin University, and that of biology by Prof. Lloyd Morgan of University College, Bristol. The work is expected to be ready during the present year.

Necrology.—Prof. J. Delbœuf, of the University of Liège, died at Bonn on August 14, 1896, at the age of 65 years. In addition to his works on hypnotism, which have given him an international reputation, he wrote on fatigue, sleep, the psycho-physical law and other experimental topics.

Prof. R. Avenarius, of the University of Zurich, editor of the *Vierteljahrschrift für wissenschaftliche Philosophie*, died on August 18, 1896.

Prof. M. W. Drobisch, of the University of Leipzig, died on September 30th, at the age of 94 years.

The following changes in the *personel* of various universities have occurred during the year:

Mr. G. F. Stout, fellow of St. John's College, Cambridge, and editor of *Mind*, has been appointed to the Anderson lectureship on comparative psychology, recently founded at Aberdeen.

Prof. E. B. Delabarre, of Brown University, has been appointed director of the psychological laboratory of Harvard University for the year 1896–7, during the absence of Prof. Münsterberg. In the same university J. E. Lough has been appointed instructor in experimental psychology, and C. M. Bakewell instructor in psychology.

Dr. C. A. Strong, associate professor of psychology in the University of Chicago, has been elected lecturer on psychology in Columbia University; Dr. Franz Boas has been appointed lecturer in physical anthropology, and S. I. Franz and L. B. McWhood have been appointed fellows in psychology, in the same institution.

H. C. Warren has been appointed assistant professor of experimental psychology in Princeton University; J. F. Crawford has been appointed demonstrator in experimental psychology.

At Bryn Mawr College, Prof. Lightner Witmer, of the University of Pennsylvania, has been appointed to give a course in experimental psychology, and Dr. H. T. Lukens, of Clark University, has been appointed professor of education.

Dr. Mark Wenley, late examiner in philosophy in the University of Glasgow, and lecturer at the Queen Margaret College, has been appointed professor of philosophy in the University of Michigan; Dr. Edgar Pierce has been appointed instructor in psychology.

Dr. Herbert Nichols, formerly instructor in psychology at Harvard University, has been appointed lecturer in psychology at Johns Hopkins University.

Dr. Guy Tawney, demonstrator in psychology in Princeton University has been appointed to the chair of philosophy in Beloit College, Wisconsin, made vacant by the death of Prof. Blaisdell.

Dr. C. H. Judd has been appointed instructor in psychology at Wesleyan University.

Dr. Arthur Allin, honorary fellow in psychology at Clark University, has been appointed professor of psychology and pedagogy in the Ohio University at Athens.

Dr. C. A. Scott has been appointed to the chair of experimental psychology and child-study at the Chicago Normal School.

Dr. E. L. Hinman, of Cornell, has been appointed instructor in philosophy and psychology in the University of Nebraska.

Dr. Alice J. Hamlin, of Cornell, has been selected to teach psychology in Mount Holyoke Seminary.—H. C. WARREN.

Studies in the Telegraphic Language.—In the *Psychological Review* for January, Mr. Harter, of Indiana University, reports an elaborate study of the telegraphic language. The whole study occupied about three years, and consisted of three parts; a cross-examination of many operators, novices as well as experts; an experimental study of individual differences, by the use of the Marey drum; and a study of the curve of improvement in sending and receiving. The following are some of the most interesting results.

I. *The character of telegraphy as a language.*—Telegraphy is a true language, in which operators are able to think. At a rapid rate of receiving, separate words cannot be distinguished, but words and groups of words are distinguished as wholes. Just as in reading, a grammatical error in a message is at once detected by the receiver, even when he gives no attention to the sense. An expert operator is able to follow his own machine with its individual differences even in the midst of louder machines, and when transferred to a new machine or to new surroundings may be unable to receive. Operators are keenly alive to the presence of those with whom they communicate; so much so that novices are often paralyzed by stage fright. External disturbances confuse novices, but have no effect on experts. Subjective disturbances, while they confuse or paralyze novices, render experts more fluent. Experts, too, are able to express their emotions over the wire. Thus there is an *anger-flutter*, during which the sender exhibits every physical sign of passion. During the laughter signal, (an oft-repeated "ha,") on the contrary, the sender exhibits no sign of humor, though his subjective risibilities may be considerably excited.

II. *Individual differences in sending.*—Sixteen subjects were tested on eight repetitions of the sentence: "Ship 364 wagons via Erie quick." The study of the records on the Marey drum involved about twenty thousand measurements. From these were ascertained the relative length for each person, first, of all the telegraphic elements; second, of the elements in the word "via"; and third, of the elements in the letter *v*, for six subjects. It was found that the individual variations in each of these results had an identifying value for each individual, and that these differences persisted through different rates of speed. These variations are due to two factors, one accidental, standing in inverse ratio to skill; the other intentional, corresponding to inflection in speech. The latter factor is what gives operators so complete an ability to recognize other operators across the wire.

III. *The curve of improvement in learning.*—The sending curve rises more rapidly and more uniformly than does the receiving curve from the beginning of practice to the learner's maximum ability. In the receiving curve there are two "plateaus," one just preceding the ordinary telegraphic rate, and another, if the learner continues to practice increasingly difficult work, just above it. It then rises again till it *crosses* the sending curve. Experts can invariably receive more rapidly than send. The slower rate of improvement in receiving is due partly to an unavoidable lack of practice, together with greater pleasure in sending. But the plateaus have a special significance; for while they exhibit no measureable improvement, they are indispensable conditions of a more rapid improvement after they are passed.

Only intense effort educates in receiving. Even years of practice do not assure improvement unless there is a constant increase in the difficulties of the task. Every new step in advance seems to cost more than the former.

This detailed and careful study of telegraphy proves with scientific rigor that it is a true language, which becomes so thoroughly assimilated that thinking apparently resolves itself into the telegraphic shorthand, and which admits of delicate individual inflection and emotional expression. The principles, too, which underlie the process of acquiring it may have important pedagogical applications.—J. FORSYTH CRAWFORD.

Mrs. Helen Gardener on the Inheritence of Subserviency.—Mrs. Helen Gardener is a frequent contributor to that highly speculative and rarely scientific Journal the Arena. At the Congress of Mothers recently held in Washington she read a remarkable paper on heredity. As reported in the daily press it calls for some remarks, especially as it is stated that she says that her opinions "deal with demonstrable facts," and that her "theme is scientific." Her thesis is that "self-abnegation, subserviency to man, whether he be father, lover, or husband, is the most dangerous theory that can be taught to or forced upon a woman. She has no right to transmit a nature and a character that is subservient, inefficient, undeveloped", etc. This opinion is in large part based on the supposition that the mother's physical influence in heredity is greater than the father's and that the mother's mental condition is more certainly transmitted to the child than is that of the fathers. Now there is not the slightest scientific ground for such an opinion. It is a common opinion among the breeders of domesticated animals that the father transmits the mental, and the mother the physical qualities. Whether this be generally so or not, it is well known that in mankind the father's mental characters are at least as often transmitted as are those of the mother.

But one of the results of recent investigation into heredity is the establishment of the general principle that characteristics which are of a temporary or one-sexed character are not as easily transmitted as was formerly supposed. The germ-cells are so protected that long periods of time and long-continued influences are required to produce appreciable changes of character in a family or a race. This truth may spare mothers a good deal of anxiety as to the effects of their conduct during gestation, though of course unhygienic habits will produce diseased conditions in children. This, however, is disease and not character.

But the development of adaptability of character is absolutely essential to the existence of the family and of society. Nature has placed in the hands of the man the strength of body and mind to combat and use her forces to a degree far exceeding that with which she has endowed woman. It has, therefore, come about that woman has found her most congenial as well as useful field in the family. Moreover the perfect development of mankind requires that the altruistic traits shall be fostered as well as the egoistic. The natural functions of woman develop the former, while those of the man develop the latter. Fortunately it has results that both qualities have been inherited by each sex, but with the predominance in each of that which is most necessary in their respective fields. The course of human evolution has not tended to unify the sexes, but to diversify them. This is a well-known result of scientific research.

The paper of Mrs. Gardener has a distinct tendency to discourage the beneficent and altruistic role which woman fills in civilized society, and to strike at the root of that admirable adaptiveness of many women, which is a guarantee of domestic harmony. And this is of more importance to human civilization and development than any theory as to woman's so-called individual independence. Like all other theories of individualism and anarchism it tends of the destruction of coöperative life, which is in the family the basis of civilization.

This well understood position does not mean the neglect by woman of her intellectual life. In this she should be, as in her moral nature, as much a guardian of human progress as the man. But in the moral nature she should guard the altruistic, as man is forced to develop the egoistic; otherwise man is likely to develop egoism in excess, and degenerate rather than advance in the scale of spiritual being.

E. D. COPE.

ANTHROPOLOGY.[1]

Mr. Wilson's investigation of the Swastika Cross.—Two lines intersecting at right angles, to form a cross, make a *Swastika* (as the Buddists called it in Sanscrit) if you bend the ends of the four arms in the same direction. Drawn, painted, cut, woven, scratched or otherwise designed upon utensils, or objects of every day life, the interesting figure appeared first, it seems, in the bronze (possibly polished stone age) of Europe and though not found in the earlier chipped stone (Neolithic) period, was discovered later among the Etruskans, Greeks, and Troyans (at Hissarlik or Troy). It seems to have been unknown in Assyria, Babylonia, Phoenicia and Egypt, but was used in India before the Christian Era, and persists not only in the Orient but also among the Finns and Lapps, and in remote corners of Europe, while generally disused for the last thousand years in Christendom.

To establish its existence in the new world Mr. Wilson, in a handsomely illustrated volume (The Swastika by Thomas Wilson, Curator Department of Prehistoric Anthropology, United States National Museum, Washington Government printing office 1896) presents valuable evidence. His numerous illustrations show the figure carved on shells from the Fains Island and Toes mounds, Tennessee, silhouetted on the copper plates from the Hopewell tumuli in Ohio, doubtfully painted on a water jug from Poinsett County, Arkansas, and carved on a stone metate from Nicaragua and a slab of lime stone from Yucatan. The Kansas Indians drew it on their song charts as shown, we see it woven in the bead-necklaces of the Sacs, painted on a gourd rattle of the Pueblos and figured in the dry sand paintings of the Navajoes. So the lucky sign we are told ornaments the bead work of the Kickapoos

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[1] This department is edited by H. C. Mercer, University of Pennsylvania.